

What is Claimed is:

1. A satellite radiotelephone system comprising:
a space-based component that is configured to receive wireless communications from radiotelephones in a satellite footprint over an uplink satellite radiotelephone frequency and to transmit wireless communications to the radiotelephones over a downlink satellite radiotelephone frequency; and
5 an ancillary terrestrial network that is configured to transmit wireless communications to, and receive wireless communications from, the radiotelephones over the downlink satellite radiotelephone frequency in a time-division duplex mode.

- 10 2. A satellite radiotelephone system according to Claim 1 wherein the ancillary terrestrial network also is configured to transmit wireless communications to, and receive wireless communications from, the radiotelephones over the uplink satellite radiotelephone frequency in a time-division duplex mode.

- 15 3. A satellite radiotelephone system according to Claim 1 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications to the radiotelephones over the downlink satellite radiotelephone frequency and wherein at least a second one of the slots is used to receive wireless communications from the radiotelephones over the downlink satellite radiotelephone frequency.
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4. A satellite radiotelephone system according to Claim 1 wherein the downlink satellite radiotelephone frequency comprises a downlink satellite radiotelephone frequency band and wherein the ancillary terrestrial network is configured to transmit wireless communications to, and receive wireless communications from, the radiotelephones over the downlink satellite radiotelephone frequency band in a time-division duplex mode.
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5. A satellite radiotelephone system according to Claim 1 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein a first number of the slots is used to transmit wireless communications to the radiotelephones over the downlink satellite radiotelephone frequency and wherein a second number of the slots is used to receive wireless communications from the
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radiotelephones over the downlink satellite radiotelephone frequency, wherein the first number is greater than the second number.

6. A satellite radiotelephone system according to Claim 1 wherein the
5 time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications to the radiotelephones over the downlink satellite radiotelephone frequency using EDGE modulation and/or protocol and wherein at least a second one of the slots is used to receive wireless communications from the radiotelephones over the downlink satellite
10 radiotelephone frequency using GPRS modulation and/or protocol.

7. A satellite radiotelephone system according to Claim 1 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications to the radiotelephones over the downlink satellite radiotelephone frequency using a first modulation and/or protocol and wherein at least a second one of the slots is used to receive wireless communications from the radiotelephones over the downlink satellite radiotelephone frequency using a second modulation and/or protocol, wherein the first modulation and/or protocol is more spectrally efficient than the second modulation
15 and/or protocol.
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8. An ancillary terrestrial component for a satellite radiotelephone system that includes a space-based component that is configured to receive wireless communications from radiotelephones in a satellite footprint over an uplink satellite
25 radiotelephone frequency and to transmit wireless communications to the radiotelephones over a downlink satellite radiotelephone frequency, the ancillary terrestrial component comprising:

30 an electronics system that is configured to transmit wireless communications to, and receive wireless communications from, the radiotelephones over the downlink satellite radiotelephone frequency in a time-division duplex mode.

9. An ancillary terrestrial component according to Claim 8 wherein the electronics system also is configured to transmit wireless communications to, and

receive wireless communications from, the radiotelephones over the uplink satellite radiotelephone frequency in a time-division duplex mode.

10. An ancillary terrestrial component according to Claim 8 wherein the
5 time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications to the radiotelephones over the downlink satellite radiotelephone frequency and wherein at least a second one of the slots is used to receive wireless communications from the radiotelephones over the downlink satellite radiotelephone frequency.

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11. An ancillary terrestrial component according to Claim 8 wherein the downlink satellite radiotelephone frequency comprises a downlink satellite radiotelephone frequency band and wherein the electronics system is configured to transmit wireless communications to, and receive wireless communications from, the
15 radiotelephones over the downlink satellite radiotelephone frequency band in a time-division duplex mode.

12. An ancillary terrestrial component according to Claim 8 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein a
20 first number of the slots is used to transmit wireless communications to the radiotelephones over the downlink satellite radiotelephone frequency and wherein a second number of the slots is used to receive wireless communications from the radiotelephones over the downlink satellite radiotelephone frequency, wherein the first number is greater than the second number.

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13. An ancillary terrestrial component according to Claim 8 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications to the radiotelephones over the downlink satellite radiotelephone frequency using EDGE
30 modulation and/or protocol and wherein at least a second one of the slots is used to receive wireless communications from the radiotelephones over the downlink satellite radiotelephone frequency using GPRS modulation and/or protocol.

14. An ancillary terrestrial component according to Claim 8 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications to the radiotelephones over the downlink satellite radiotelephone frequency using a first 5 modulation and/or protocol and wherein at least a second one of the slots is used to receive wireless communications from the radiotelephones over the downlink satellite radiotelephone frequency using a second modulation and/or protocol, wherein the first modulation and/or protocol is more spectrally efficient than the second modulation and/or protocol.

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15. A radiotelephone comprising:
an electronics system that is configured to transmit wireless communications to a space-based component over an uplink satellite radiotelephone frequency and to receive wireless communications from the space-based component over a downlink 15 satellite radiotelephone frequency;
the electronics system further configured to transmit wireless communications to, and receive wireless communications from, an ancillary terrestrial component over the downlink satellite radiotelephone frequency in a time-division duplex mode.

20 16. A radiotelephone according to Claim 15 wherein the electronics system also is configured to transmit wireless communications to, and receive wireless communications from, the ancillary terrestrial component over the uplink satellite radiotelephone frequency in a time-division duplex mode.

25 17. A radiotelephone according to Claim 15 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications to the ancillary terrestrial component over the downlink satellite radiotelephone frequency and wherein at least a second one of the slots is used to receive wireless communications from the 30 ancillary terrestrial component over the downlink satellite radiotelephone frequency.

18. A radiotelephone according to Claim 15 wherein the downlink satellite radiotelephone frequency comprises a downlink satellite radiotelephone frequency band and wherein the electronics system also is configured to transmit wireless

communications to, and receive wireless communications from, the ancillary terrestrial component over the downlink satellite radiotelephone frequency band in a time-division duplex mode.

5 19. A radiotelephone according to Claim 15 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein a first number of the slots is used to receive wireless communications at the radiotelephone over the downlink satellite radiotelephone frequency and wherein a second number of the slots is used to transmit wireless communications by the radiotelephone over the downlink 10 satellite radiotelephone frequency, wherein the first number is greater than the second number.

15 20. A radiotelephone according to Claim 15 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to receive wireless communications at the radiotelephone over the downlink satellite radiotelephone frequency using EDGE modulation and/or protocol and wherein at least a second one of the slots is used to transmit wireless communications by the radiotelephone over the downlink satellite radiotelephone frequency using GPRS modulation and/or protocol.

20 21. A radiotelephone according to Claim 15 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to receive wireless communications at the radiotelephone over the downlink satellite radiotelephone frequency using a first modulation and/or protocol 25 and wherein at least a second one of the slots is used to transmit wireless communications by the radiotelephone over the downlink satellite radiotelephone frequency using a second modulation and/or protocol, wherein the first modulation and/or protocol is more spectrally efficient than the second modulation and/or protocol.

30 22. A satellite radiotelephone communication method comprising:
 receiving wireless communications at a space-based component from radiotelephones in a satellite footprint over an uplink satellite radiotelephone frequency;

transmitting wireless communications from the space-based component to the radiotelephones over a downlink radiotelephone frequency; and

transmitting wireless communications from an ancillary terrestrial network to the radiotelephones and transmitting wireless communications from the

5 radiotelephones to the ancillary terrestrial network over the downlink satellite radiotelephone frequency in a time-division duplex mode.

23. A method according to Claim 22 further comprising:

transmitting wireless communications from the ancillary terrestrial network to
10 the radiotelephones and transmitting wireless communications from the radiotelephones to the ancillary terrestrial network over the uplink satellite radiotelephone frequency in a time-division duplex mode.

24. A method according to Claim 22 wherein the time-division duplex

15 mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications from the ancillary terrestrial network to the radiotelephones over the downlink satellite radiotelephone frequency and wherein at least a second one of the slots is used to transmit wireless communications from the radiotelephones to the ancillary terrestrial network over the
20 downlink satellite radiotelephone frequency.

25. A method according to Claim 22 wherein the downlink satellite

radiotelephone frequency comprises a downlink satellite radiotelephone frequency band and wherein the method further comprises transmitting wireless communications from the ancillary terrestrial network to the radiotelephones and transmitting wireless communications from the radiotelephones to the ancillary terrestrial network over the downlink satellite radiotelephone frequency band in a time-division duplex mode.

26. A method according to Claim 22 wherein the time-division duplex

30 mode includes a frame including a plurality of slots, wherein a first number of the slots is used to transmit wireless communications from the ancillary terrestrial network to the radiotelephones over the downlink satellite radiotelephone frequency and wherein a second number of the slots is used to transmit wireless communications from the radiotelephones to the ancillary terrestrial network over the downlink

satellite radiotelephone frequency, wherein the first number is greater than the second number.

27. A method according to Claim 22 wherein the time-division duplex
5 mode includes a frame including a plurality of slots, wherein at least a first one of the
slots is used to transmit wireless communications from the ancillary terrestrial
network to the radiotelephones over the downlink satellite radiotelephone frequency
using EDGE modulation and/or protocol and wherein at least a second one of the slots
10 is used to transmit wireless communications from the radiotelephones to the ancillary
terrestrial network over the downlink satellite radiotelephone frequency using GPRS
modulation and/or protocol.

28. A method according to Claim 22 wherein the time-division duplex
mode includes a frame including a plurality of slots, wherein at least a first one of the
15 slots is used to transmit wireless communications from the ancillary terrestrial
network to the radiotelephones over the downlink satellite radiotelephone frequency
using a first modulation and/or protocol and wherein at least a second one of the slots
is used to transmit wireless communications from the radiotelephones to the ancillary
terrestrial network over the downlink satellite radiotelephone frequency using a
20 second modulation and/or protocol, wherein the first modulation and/or protocol is
more spectrally efficient than the second modulation and/or protocol.

29. A radiotelephone communication method comprising:
transmitting wireless communications from an ancillary terrestrial network to
25 radiotelephones and receiving wireless communications from the radiotelephones at
the ancillary terrestrial network over a downlink satellite radiotelephone frequency in
a time-division duplex mode.

30. A method according to Claim 29 further comprising:
30 transmitting wireless communications from the ancillary terrestrial network to
the radiotelephones and receiving wireless communications from the radiotelephones
at the ancillary terrestrial network over an uplink satellite radiotelephone frequency in
a time-division duplex mode.

31. A method according to Claim 29 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications from the ancillary terrestrial network to the radiotelephones over the downlink satellite radiotelephone frequency and wherein at least a second one of the slots is used to receive wireless communications from the radiotelephones at the ancillary terrestrial network over the downlink satellite radiotelephone frequency.

32. A method according to Claim 29 wherein the downlink satellite radiotelephone frequency comprises a downlink satellite radiotelephone frequency band and wherein the transmitting comprises transmitting wireless communications from the ancillary terrestrial network to the radiotelephones and receiving wireless communications from the radiotelephones at the ancillary terrestrial network over the downlink satellite radiotelephone frequency band in a time-division duplex mode.

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33. A method according to Claim 29 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein a first number of the slots is used to transmit wireless communications from the ancillary terrestrial network to the radiotelephones over the downlink satellite radiotelephone frequency and wherein a second number of the slots is used to receive wireless communications at the ancillary terrestrial network from the radiotelephones over the downlink satellite radiotelephone frequency, wherein the first number is greater than the second number.

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34. A method according to Claim 29 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications from the ancillary terrestrial network to the radiotelephones over the downlink satellite radiotelephone frequency using EDGE modulation and/or protocol and wherein at least a second one of the slots is used to receive wireless communications at the ancillary terrestrial network from the radiotelephones over the downlink satellite radiotelephone frequency using GPRS modulation and/or protocol.

35. A method according to Claim 29 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to transmit wireless communications from the ancillary terrestrial network to the radiotelephones over the downlink satellite radiotelephone frequency using a first modulation and/or protocol and wherein at least a second one of the slots is used to receive wireless communications at the ancillary terrestrial network from the radiotelephones over the downlink satellite radiotelephone frequency using a second modulation and/or protocol, wherein the first modulation and/or protocol is more spectrally efficient than the second modulation and/or protocol.

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36. A radiotelephone communication method comprising:
receiving wireless communications from an ancillary terrestrial network at radiotelephones and transmitting wireless communications from the radiotelephones to the ancillary terrestrial network over a downlink satellite radiotelephone frequency in a time-division duplex mode.

37. A method according to Claim 36 further comprising:
receiving wireless communications from the ancillary terrestrial network at the radiotelephones and transmitting wireless communications from the radiotelephones to the ancillary terrestrial network over an uplink satellite radiotelephone frequency in a time-division duplex mode.

38. A method according to Claim 36 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to receive wireless communications from the ancillary terrestrial network at the radiotelephones over the downlink satellite radiotelephone frequency and wherein at least a second one of the slots is used to transmit wireless communications from the radiotelephones to the ancillary terrestrial network over the downlink satellite radiotelephone frequency.

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39. A method according to Claim 36 wherein the downlink satellite radiotelephone frequency comprises a downlink satellite radiotelephone frequency band and wherein the receiving comprises receiving wireless communications from the ancillary terrestrial network at the radiotelephone, and transmitting wireless

communications from the radiotelephones to the ancillary terrestrial network over the downlink satellite radiotelephone frequency band in a time-division duplex mode.

40. A method according to Claim 36 wherein the time-division duplex
5 mode includes a frame including a plurality of slots, wherein a first number of the slots is used to receive wireless communications at the radiotelephones from the ancillary terrestrial network over the downlink satellite radiotelephone frequency and wherein a second number of the slots is used to transmit wireless communications from the radiotelephones to the ancillary terrestrial network over the downlink
10 satellite radiotelephone frequency, wherein the first number is greater than the second number.

41. A method according to Claim 36 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to receive wireless communications at the radiotelephones from the ancillary terrestrial network over the downlink satellite radiotelephone frequency using EDGE modulation and/or protocol and wherein at least a second one of the slots is used to transmit wireless communications from the radiotelephones to the ancillary terrestrial network over the downlink satellite radiotelephone frequency using GPRS
20 modulation and/or protocol.

42. A method according to Claim 36 wherein the time-division duplex mode includes a frame including a plurality of slots, wherein at least a first one of the slots is used to receive wireless communications at the radiotelephone from the ancillary terrestrial network over the downlink satellite radiotelephone frequency using a first modulation and/or protocol and wherein at least a second one of the slots is used to transmit wireless communications from the radiotelephone to the ancillary terrestrial network over the downlink satellite radiotelephone frequency using a second modulation and/or protocol, wherein the first modulation and/or protocol is
30 more spectrally efficient than the second modulation and/or protocol.